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Papers Accepted for Publication in Chromatographia

Detection of Thiophenes in the Offgas Condensate of an Oil Shale Retort by a GC-Microwave Induced Helium Plasma Detector

— by D. S. Sklarew, K. B. Olsen and J. C. Evans

A series of alkylthiophenes and dimethyl disulfide were tentatively identified in an oil shale retort gas condensate from a 6-kg bench-scale retort using gas chromatography with a microwave-induced helium plasma detector (GC-MIP). The sulfur species were present in concentrations ranging from 1.5 to 10.7 mol ppm in the undiluted offgas. The GC-MIP technique was successful in selectively detecting the sulfur components in the complex mixture. Quantitation was simplified relative to GC with flame-photometric detection because of the absence of quenching or other interference problems at the concentrations studied. Attempts to determine stoichiometry of the sulfur components by comparison of carbon, hydrogen, and sulfur ratios with those of standards were unsuccessful because of the complexity of the carbon and hydrogen chromatograms.

A Bi-Directional HPTLC Development Method for the Detection of Low Levels of Aflatoxin in Maize Extracts

— by K. I. Tomlins, K. Jewers, R. D. Coker and M. J. Nagler

A bi-directional high performance thin layer chromatography (HPTLC) method for the determination of low levels of aflatoxin in extracts of maize has been evaluated. The method, using diethylether and chloroform : xylene : acetone (6 : 3 : 1) as the two developing solvents was found to have a limit of detection of 0.8 (B_1), 0.4 (B_2), 1.7 (G_1) and 0.4 (G_2) µg/kg respectively, with CVs equal or less than 1.7 % (B_1), 2.5 % (B_2), 3.1 % (G_1), and 3.1 % (G_2). Inter-plate variation was significantly greater than intraplate variation.

Compared with two-dimensional HPTLC methods, a 15 to 30 fold improvement in the sample capacity per plate is achieved and positioning errors are much reduced during densitometry.

RPLC Retention of 1,ω-Di(alkoxy)-Polysulphides

— by Eris Singer and H. J. Möckel

The reaction of S_2Cl_2 with alcohols yields products, the reversed-phase liquid chromatograms of which are similar to those of dialkyl-polysulphides RS_nR, i.e., they represent homologous series. Four of the products were identified via GC-MS as 1,ω-di(alkoxy)-polysulphides having the general structure ROS_nOR. Retention contributions of alkyl groups R and sulphur atoms in the $-S_n-$ chain are not much different from values observed with polysulphides. The effect of oxygen, however, is only about − 100 index units per O atom, while in dialkyl ethers values of − 500 units have been reported.

Prediction of HPLC Retention Times in Gradient Elution from Isocratic Data Application to a Set of Non-Homologous Compounds and Different Stationary Phases

— by E. Marengo, C. Baiocchi, M. C. Gennaro and P. Bertolo

A chromatographic model able to predict, from experimental isocratic data, retention times of solutes under gradient conditions has been proposed previously. The prediction was shown to be totally independent of the chemical properties of both solutes and eluents.

In order to further check the general validity of the theory, the model has now been applied to a non-homologous set of compounds, namely a range of substituted quinolines (methyl-, hydroxy- and amino-) and several different stationary phases.

Results show a dependence on the stationary phase and, to a lesser extent, on the chemical structure of the solutes. The possible sources of errors are discussed.

The generality of the method holds, within acceptable limits, if predictions concern the same type of stationary phase.

Automatic Determination of Selected C2–C4 Hydrocarbons in Urban Air by Solid Sorbent Sampling and Gas Chromatography

— by K-A. Persson and S. Berg

A new automatic method is described for quantitative determination of some light C2–C4 hydrocarbons in urban air: ethene, ethyne, propane, propene, butane and iso-butane. This method is based on an enrichment step at room temperature using a solid sorbent and subsequent thermal desorption for gas chromatographic separation and FID detection. The instrument is built up of a small commercial gas chromatograph and a laboratory-made trap and desorption unit. The sampling parameters, sample volume, concentration and humidity of air have been investigated.

Non-Linearity in Constant-Current Electron-Capture Detection

— by P. Rotocki and B. Drozdowicz

The effects of the ionization source activity, sample input rate, electron capture rate constant, ventilation rate constant and baseline frequency on the linearity, detectability and sensitivity of the constant-current electron-capture detector (CC-ECD) were investigated. The proposed model representing an extension of the Wenthworth-Lovelock model proved to be useful in demonstrating that the CC-ECD can be highly non-linear for strong electron capturers, at high ionization source activities, at a low ventilation rate constant and at low baseline frequencies. Optimization of the CC-ECD operation is possible by a reasonable adjustment of the studied parameters.